

REMARKS/ARGUMENTS

The Notice of Non-Compliant Amendment of January 29, 2007 and the Office Action of October 16, 2006 has been carefully reviewed and this response addresses the Examiner's concerns stated in the Office Action.

I. NOTICE OF NON-COMPLIANT AMENDMENT

Applicant inadvertently omitted page 6 from his original response filed on January 16, 2007. Applicant re-submits herewith his response, including the previously-omitted page 6.

II. STATUS OF THE CLAIMS

Claims 1-17 are pending in the application.

Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Rose et al. (US 2002/0154855).

Claims 1-4 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire (US 6,941,073) in view of Rose et al.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of Sutherland et al. (US 7,018,563).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of George et al. (US 4,834,474).

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of Doerr (US 2002/0131683).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima et al. (US 2004/0076368).

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima et al. and further in view of Sutherland.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima and further in view of McGuire.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. in view of Sutherland et al.

Claims 6 and 9 are amended to correct informalities.

Claims 1, 8, 11 and 16 are amended in order to better describe the invention.

Support in the specification for the claim amendments

Amendments to claim 1 find support in Fig.1 and in paragraphs 27-35 of the specification.

Amendments to claim 8 find support in Fig.3 and in paragraphs 42-45 of the specification.

Amendments to claim 11 find support in Fig.5 and in paragraphs 47-49 of the specification.

Amendments to claim 16 find support in Figs.1-5 and in the corresponding paragraphs, including 27-35, 42-45, 47-49, of the specification.

III. THE 1.131 DECLARATIONS

As shown in the attached Rule 1.131 declarations by the Applicant/inventor, Thomas W. Stone, and the Patent agent/attorney, Orlando Lopez, the invention was conceived before the priority date of U.S. Patent No. 6,941,073, July 23, 2002, and the Priority date of US patent 7,018,563, November 26, 2002, and the 102 (e) date of US patent application publication 2004/0076368, April 15, 2003, and that the inventor and his attorneys diligently worked towards filing the a patent application. Applicant asserts that U.S. Patents No. 6,941,073, 7,018,563 and US patent application publication 2004/0076368 are not 35 U.S.C. 102(e) prior art.

In the declaration enclosed, Patent attorney Orlando Lopez provides the dates relied upon for diligence. In regards to the Applicant's present patent application, the following factors should be considered in establishing due diligence. The Applicant was not employed by the assignee during the period over which diligence is established and, furthermore, the Applicant was also engaged in the review in the drafting of 8 or more other related patent applications while reestablishing his own business. The present situation is similar to that in *Bey* since the applicant and his patent attorney worked reasonably hard to prosecute a large number of related cases. Therefore, Applicant respectfully states that the diligence from prior to the filing date of the Doerr reference has been established.

Applicant asserts that U.S. Patents No. 6,941,073, 7,018,563 and US patent application publication 2004/0076368 are not 35 U.S.C. 102(e) prior art.

IV. CLAIM REJECTIONS UNDER 35 U.S.C. 112

Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite.
Amendments to claim 16 renders the claim definite by providing proper antecedent basis, “all of said plurality of gratings, said first beam/port and said plurality of second beam/ports first series of optical components being.”

V. CLAIM REJECTIONS UNDER 35 U.S.C. 102

Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Rose et al. (US 2002/0154855) (the '855 publication).

Amended claim 16 recites “a plurality of gratings comprising at least five gratings... at least one grating from said plurality of gratings being a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of an incident beam; another one of said at least two states corresponding to substantially diffracting at least another portion of said incident beam; said at least one grating being optically disposed between two other gratings from said plurality of gratings; said at least one grating being capable of transmitting said at least a portion of a beam incident from one of said two other gratings to another one of said two other gratings; and, said at least one grating being also capable of transmitting said at least another portion of a beam incident from one of said two other gratings to another grating from said said plurality of gratings.”

The '855 publication discloses

[0063] The collimated light beam 212 is incident on a first transmission diffraction grating 214. The transmission diffraction grating 214 may be formed from glass, and other suitable materials that transmit light at the wavelength range of interest. Such materials may include Si, SiO₂, Si₃N₄ and SiON. One applicable wavelength range of interest is 800 nm-2000 nm, which covers the range of wavelengths typically selected for optical fiber communications, although it will be appreciated that other wavelength ranges may be used.

[0064] The term transmission diffraction grating as used herein refers to

structures that diffract light passing therethrough. The transmission diffraction grating may have a strictly periodic structure, known as a linear grating, or may have a structure that is not strictly periodic, termed a nonlinear grating. For example, the structure may have a chirped period, where the period changes from one end of the structure to the other. Use of a chirped grating requires the use of a different focusing element from a linear grating. If there is a substantial variation in the periodicity of the transmission diffraction grating, then the transmission diffraction grating demonstrates focusing capabilities in addition to dispersing the different wavelengths of the light passing therethrough. Such a grating may also be termed a diffractive optical element (DOE). In the following description, the terms transmission diffraction grating refers to both linear and nonlinear gratings. Many of the examples described below illustrate the use of a linear grating, but it will be appreciated by those of ordinary skill in the art that nonlinear transmission gratings may also be used.

[0065] One approach to forming a transmission diffraction grating 214 is to etch a slotted structure into a substrate. The depth and length of the slots, and the ratio of the etched slot width to the unetched material width between slots, determine, at least in part, the diffraction properties of the transmission diffraction grating 214. The spatial variation in grating periodicity determines the focusing capabilities of the transmission diffraction grating 214. The transmission diffraction grating 214 may have a diffraction efficiency into the first diffraction order as high as 99.9%. In one embodiment of a grating 214, particularly suitable where the light entering the device 200 is TE polarized, the grating is formed from fused silica, the grating period is 1050 nm, with a groove duty cycle of 51%. The groove depth is about 2 .mu.m and the incident angle on the grating is about 31.degree.. In another embodiment of grating, particularly suitable for randomly polarized light, the groove depth is about 6.7 .mu.m.

[0066] The collimated light beam 212 is diffracted by the first transmission diffraction grating 214 towards a second transmission diffraction grating 216 as a singly-diffracted beam 218. The singly-diffracted beam 218 is diffracted by

the second transmission diffraction grating 216 towards a focusing optic 220 as a doubly-diffracted beam 222. The first and second transmission gratings 214 and 216 are typically oriented so as to diffract light into the first diffraction order.

Since the '855 publication does not disclose "at least one grating from said plurality of gratings being a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of an incident beam; another one of said at least two states corresponding to substantially diffracting at least another portion of said incident beam; said at least one grating being optically disposed between two other gratings from said plurality of gratings; said at least one grating being capable of transmitting said at least a portion of a beam incident from one of said two other gratings to another one of said two other gratings; and, said at least one grating being also capable of transmitting said at least another portion of a beam incident from one of said two other gratings to another grating from said said plurality of gratings." Applicants respectfully state that the 855 publication does not teach or disclose at least one limitation of claim 16.

VI. CLAIM REJECTIONS UNDER 35 U.S.C. 103

Claims 1-4 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire (US 6,941,073) (the '073 patent) in view of Rose.

Regarding amended claim 1, amended claim 1 recites "a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam; said pixellated, switchable grating being interposed optically between said first optical system and said second optical system;

said second grating being capable of redirecting said distinct input channels towards said pixellated, switchable grating and being capable of substantially redirecting at least a portion of said distinct input channels towards said third grating; said at least a portion of said

distinct input channels being incident on at least one pixel from said plurality of pixels; said at least one pixel being in said one of said two state values.” Considering the ‘073 patent, while not acquiescing to the fact that the ‘073 patent is valid prior art, the ‘073 patent teaches

One of a plurality of first lenses receives a first multi-channel optical signal from an optically coupled fiber in the first fiber array. The first multi-channel optical signal is directed to a first grating. The first grating diffracts the first multi-channel optical signal according to the wavelengths of each individual optical channel, and directs each channel through a second lens that focuses the individual optical channels through one of a plurality of first beam steerers and near one of a plurality of first programmable mirrors. Each first beam steerer and first mirror are associated with a particular individual optical channel.

Depending upon the programmed state of the associated mirror (e.g., engaged or not engaged), the individual optical channel is either dropped to any one of the fibers in the first fiber array, or passed to an output fiber in the second fiber array. In the case where the individual optical channel is dropped, the associated mirror is engaged and the associated beam steerer may direct the individual optical channel to any one of the fibers in the first fiber array by way of the second lens, the first grating, and one of the plurality of first lenses.” (column 7, lines 929, the ‘073 patent).

Applicant respectfully states that the 073 patent does not teach, disclose, or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

As stated above, the ‘855 publication does not teach, disclose or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident

beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” (MPEP 2143)

Since the prior art references do not teach or suggest all the limitations of claim 1, Applicant respectfully states that a *prima facie* case of obviousness has not been established. Similarly, Applicant respectfully states that there is not a reasonable expectation of success in combining the prior art references.

For the same reasons as stated above, a *prima facie* case of obviousness has not been established for claim 8 since claim 8 recites “said third pair of gratings including a switchable grating capable of being switched between states; said states comprising at least two states, one of said at least two states corresponding to substantially transmitting an incident beam; another one of said at least two state corresponding to substantially diffracting said incident beam.”

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of Sutherland et al. (US 7,018,563) (the ‘563 patent).

As stated above, Applicant respectfully states that the 073 patent does not teach, disclose, or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

As also stated above, the ‘855 publication does not teach, disclose or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

The ‘536 patent also does not teach, disclose or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

Applicant respectfully states, while not acquiescing to the fact that the ‘536 patent is valid prior art, that a prima facie case of obviousness has not been established for claim 5.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of George et al. (US 4,834,474) (the ‘474 patent).

As stated above, Applicant respectfully states that the ‘073 patent does not teach, disclose, or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

As also stated above, the ‘855 publication does not teach, disclose or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam.”

The '474 patent also does not teach, disclose or suggest "a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam."

Applicant respectfully states that a prima facie case of obviousness has not been established for claim 6.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire in view of Rose et al. and further in view of Doerr (US 2002/0131683) (the '683 publication).

As stated above, Applicant respectfully states that the '073 patent does not teach, disclose, or suggest "a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam."

The '683 publication discloses that

a wavelength blocker 100 is an optical device having two ports 110-1, 110-2 that accept an incoming signal of multiple wavelength channels at a first port 110-1 and independently pass or block each wavelength channel, i, to a second port 110-2. A demultiplexer 115-1 separates the incoming signal into each component wavelength channel, i, which is then selectively passed or blocked by the corresponding shutter 120-i (or variable optical attenuators) to a multiplexer 115-2. The wavelength blocker 100 may be embodied, for example, as the wavelength blocker disclosed in contemporaneously filed U.S. patent application Ser. No. _____, entitled "Planar Lightwave Wavelength Blocker," (Attorney

Docket Number Doerr 49), assigned to the assignee of the present invention and incorporated by reference herein, as modified herein in accordance with the present invention.

[0018] According to one feature of the present invention, each shutter 120-i is embodied as an opaque element that can be selectively positioned in and out of the lightpath to selectively pass or block light. In one embodiment, discussed further below, each shutter 120-i may be controlled by a micromachine control element that can physically lift the shutter 120-i in and out of the lightpath.

Applicant respectfully states that the '683 publication does not teach, disclose or suggest "a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam."

Applicant respectfully states that a prima facie case of obviousness has not been established for claims 9 and 10.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima et al. (US 2004/0076368) (the '368 publication).

As stated above, the '683 publication does not teach, disclose or suggest "a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam."

Applicant respectfully states that the ‘368 publication does not teach, disclose or suggest “a pixellated, switchable grating, said pixellated, switchable grating having a plurality of pixels, each of said pixels having a controllable state, said controllable state having at least two state values, one of said at least two state values corresponding to substantially transmitting an incident beam; another one of said at least two state values corresponding to substantially diffracting said incident beam,” a limitation of claim 11.

Applicant respectfully states that a prima facie case of obviousness has not been established for claim 11.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima et al. and further in view of Sutherland.

As stated above, neither Doerr, nor Takushima, nor Sutherland teach or disclose or suggest a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of said distinct input channels; another one of said at least two states corresponding to substantially diffracting at least another portion of said distinct input channels; said second grating being capable of diffracting said at least another portion of said distinct input channels towards said third grating, a limitation of claims 12 and 13.

Applicant respectfully states that a prima facie case of obviousness has not been established for claims 12 and 13.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Takushima and further in view of McGuire.

As stated above, neither Doerr, nor Takushima, nor McGuire teach or disclose or suggest a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of said distinct input channels; another one of said at least two states corresponding to substantially diffracting at least another portion of said distinct input

channels; said second grating being capable of diffracting said at least another portion of said distinct input channels towards said third grating, a limitation of claims 14 and 15.

Applicant respectfully states that a prima facie case of obviousness has not been established for claims 14 and 15.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. in view of Sutherland et al.

Are stated above, “a plurality of gratings comprising at least five gratings... at least one grating from said plurality of gratings being a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of an incident beam; another one of said at least two states corresponding to substantially diffracting at least another portion of said incident beam; said at least one grating being optically disposed between two other gratings from said plurality of gratings; said at least one grating being capable of transmitting said at least a portion of a beam incident from one of said two other gratings to another one of said two other gratings; and, said at least one grating being also capable of transmitting said at least another portion of a beam incident from one of said two other gratings to another grating from said said plurality of gratings,” a limitation of claim 17.

As also stated above, Southern and does not teach, disclose or suggest “a plurality of gratings comprising at least five gratings... at least one grating from said plurality of gratings being a pixellated, switchable grating capable of being switched between states; said states comprising at least two states; one of said at least two states corresponding to substantially transmitting at least a portion of an incident beam; another one of said at least two states corresponding to substantially diffracting at least another portion of said incident beam; said at least one grating being optically disposed between two other gratings from said plurality of gratings; said at least one grating being capable of transmitting said at least a portion of a beam incident from one of said two other gratings to another one of said two other gratings; and, said at least one grating being also capable of transmitting said at least another portion of

a beam incident from one of said two other gratings to another grating from said said plurality of gratings.”

Applicant respectfully states that a prima facie case of obviousness has not been established for claims 17.

VII. CONCLUSION

In conclusion, in view of the above amendments and remarks and enclosed 1.131 declarations, Applicant respectfully requests the Examiner find claims 1-17 allowable over the prior art and pass this case to issue.

Although no additional fees are anticipated for the consideration of this response, the Director of Patents and Trademarks is authorized to charge additional fees or credit overpayment to Deposit Account No. 50-3718.

The following information is presented in the event that a call may be deemed desirable by the Examiner:

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Respectfully submitted,
Thomas W. Stone, Applicant,

Date: February 23, 2007

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